



Thesis Project Form

Title (tentative): Physical Exercises with a Virtual Physiotherapist

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Description

Motivation and application domain

Integrating Virtual Reality exercises into rehabilitation programs has positive effects in terms of engagement, motivation, and, finally rehabilitation outcomes. This thesis will explore the use of virtual avatars to create immersive VR rehabilitation protocols.

General objectives and main activities

The thesis aims to create immersive Virtual Reality environments, showing several exercises a virtual physiotherapist performs. The avatar of the virtual physiotherapist should be animated from the measurements acquired with a mocap (Qualysis Motion Capture) system in a hospital.

The developed system should include the following features:

- Customization of the appearance of the avatar;
- Choice of the exercise from a preview;
- Storage of some useful data of the user (e.g., joints 3D positions in time, time to complete the exercise, number of performed exercises,...)
- Other to be decided

Note: the work is in collaboration with Fondazione Campus Biomedico - Rome, within the Fit4MedRob PNC PNRRR projects.

Training Objectives (technical/analytical tools, experimental methodologies)

- Development of the exergame using Unity 3D
- Integration with mocap measurements (offline and online)
- Storage and analysis of all the parameters useful to track the outcome of the training
- User testing
- Development of the user study protocol with FCBM Rome

Place(s) where the thesis work will be carried out: DIBRIS Valletta Puggia, FCBM Roma

Additional information

Pre-requisite abilities/skills: Programming in C++ or C#

Maximum number of students: 1